



Newsletter

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Director's Note

Recognition can take many forms. Medals and honors provide a delightful pat on the back and attention from friends, colleagues and the media. Election to lead a professional scientific society offers recognition along with the responsibility to provide leadership, work hard and make a difference during the term of office. This newsletter illustrates all of these forms of recognition. I am proud to be included with Jonathan Cole and Stuart Findlay as the articles describe the honors and reasons for selection. All of us are quick to note that many colleagues, students, staff and family members helped to elevate us to the visibility which results in honors. Our recognition is shared with a great many exceptional people!

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Likens Receives National Medal of Science

by Sherri Hitz

In a White House ceremony on June 12th, President George W. Bush presented fourteen American scientists and one engineer with the United States' highest scientific honor: the National Medal of Science. Bush called the 2001 group, which included Institute of Ecosystem Studies Director and President Dr. Gene E. Likens, "prophets of a better age" and he thanked them for their "lifelong commitment to making our world a better place."

The medal is awarded to recognize scientists for pioneering research that improves and augments human understanding of the world around us. Since Congress established the award in 1959, 401 recipients have been honored. Interestingly, the National Medal of Science has been given to 108 biologists, but to only six ecologists including: G. Evelyn Hutchinson (1991), and for 2001, Gene E. Likens. Since Dr. Likens holds the G. Evelyn Hutchinson Chair at IES, he is especially pleased and honored to have earned the same award as his position's namesake.

While Dr. Likens has received a plethora of awards—among them the Tyler Prize, The Australia Prize and election to the National Academy of Sciences—he says he is especially "excited and humbled" to receive the National Medal of Science both because of its magnitude, and also because he was chosen for the award by his scientific peers. As President Bush cited while presenting the medal to Dr. Likens, he was chosen both for his groundbreaking research on acid rain and for his role in developing and sustaining the fields of ecology and ecosystem science.

As is the case with many scientific discoveries, the phenomenon of acid rain was detected quite by accident. When Dr. Likens and colleagues F. Herbert Bormann, Noye Johnson and Robert S. Pierce began research at the Hubbard Brook Experimental Forest (in the White Mountains of New Hampshire) back in 1963, their goal was to develop a novel approach to studying ecosystem function. They wanted to see

if simply measuring water and chemical fluxes in a watershed system could reveal the "health" of the system, just like measuring blood or urine chemicals can reveal the health of a person.

As it turned out, the Hubbard Brook experimental watersheds had a watertight geologic basement, which meant they wouldn't have to worry about water or chemicals going in or out through the "bottom" of the site. As the group started to make measurements, to their great surprise, they discovered that the precipitation entering the forest ecosystem was very acid ["acid rain"], which fell in the form of not just rain, but snow, sleet, hail and even particulate matter.



Dr. Likens leaving the White House after the National Medal of Science Award Ceremony

As the group investigated further, they discovered the ultimate source of the acid: fossil fuel combustion. When fossil fuels, like coal and oil, are burned, they release sulfur and nitrogen oxides into the atmosphere. When these oxides react with water in the atmosphere, they form the very strong sulfuric and nitric acids, which return to the surface dissolved in the precipitation. Acid rain is, as one might expect, most prevalent in highly industrialized areas such as eastern North America, northwestern Europe, and southeastern Asia.

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Ecology Education Fellowships at IES

by Christopher Tall

I remember the hours of scrolling through web pages of job announcements. My eyes glued to the screen, I wasn't exactly sure of what I was looking for. My major in biology, with a particular interest in ecology, suggested that I might want to look for a job that would bring me outside, into nature. Ecology education was something I had not yet considered, although many in my family have been involved in education. I couldn't say whether it was my family's influence or my interest in science that made me pause at the job announcement entitled, "Ecology Education Fellowship," but I am very glad that I did. I share this experience with twelve other educators since the IES Ecology Education Fellowship program began in 1995.

2 Within the fellowship program there has always been a strong emphasis on teaching ecology through diverse Ecology Field Programs. These programs help children and young adults ranging from kindergarten through 12th grade address key concepts in ecology. What is an ecosystem? What defines a healthy ecosystem? What do ecologists do? How do you use the scientific method to create an experiment? What is a watershed? These are only a few of the subjects that we touch upon. As you can imagine, some of these questions are not so easily answered and can be very challenging to teach.

Ecology Education Fellows not only teach established ecology field programs, but they also make numerous individual contributions. Tom Moorcroft, one of the first education Fellows, was lead author on a paper entitled "Authentic assessment in the informal setting: how it can work for you" in the *Journal of Environmental Education* (31:20-24). Amy Brush created a scholarship program for the Poughkeepsie Children's Home that allows children to attend the IES day camps for free. Shannon Wood began a tradition of offering after-school enrichment programs with the Alden Place Elementary School in Millbrook. Last winter we focused our enrichment program on ornithology, including a visit by a falcon and an owl from the Hudson Valley Raptor Center. Fellows help strengthen the link between IES and the surrounding community.

Most Fellows, that have worked at IES have been AmeriCorps members. AmeriCorps is a network of national service programs that engages more than 50,000 Americans each year in service to meet critical needs in education, public safety, health, and the environment. AmeriCorps members serve through more than 2,100 organizations and public agencies.

Members usually serve a ten-month term and receive a small stipend for living expenses. After completing a term each Member receives a \$4,725 educational award that can be used towards further schooling or for paying back loans.

The Youth Resource Development Corporation (YRDC) in Poughkeepsie has worked as the Institute's partner in developing the Ecology Education Fellowship program. YRDC's Building Bridges AmeriCorps Program is the largest full-time AmeriCorps program in the Hudson Valley. YRDC AmeriCorps Members work at numerous local environmental organizations implementing watershed education, management and restoration projects designed to preserve the rural quality of our region. The Student Conservation Association has also partnered with IES to bring Fellows to our program.

As my term comes to an end at IES, I have been wondering what happens to Education Fellows after their time here, so I caught up with some former Fellows. Jennifer Purrenhage is currently working on her M.S. degree in Biology (focusing on genetic differentiation in spotted salamanders) and also a Certificate of Technical Education. Amy Brush is starting a master's program in botanical medicine. Shannon Wood, while teaching at a summer camp in New Hampshire, says that she would like to "replicate the thorough thought processes that the IES ecology education team used to create challenging, meaningful lessons." David Burns, who is currently the Watershed Coordinator for the Dutchess County Environmental Management Council, writes that "the AmeriCorps program provided me with the opportunity to gain hands-on experience in a field difficult to break into. Eventually, this led to full time employment in the water resource field that otherwise wouldn't have been possible."

The IES Education Fellowship program is an excellent training opportunity and opens doors to many interesting career possibilities. I am exceedingly grateful that I found this wonderful place to work.



Lisa Passerello, Sarah Hall, and Chris Tall are this year's Fellows

Likens, continued from page 1

If acid rain did not harm or injure living or nonliving things, its discovery by Dr. Likens and colleagues might have never even made it into the public spotlight. But acid rain has negative—often devastating—effects, ranging from slowing tree growth, to sickening and killing fish and other aquatic organisms, to degrading limestone structures of historical or contemporary importance such as buildings, statues and tombstones. Unfortunately, acid rain has become more prevalent and widespread, as countries consume greater amounts of fossil fuels. In the U.S. and abroad, public policy seems to be the only way to control the growing acid rain problem.

Dr. Likens has worked with a variety of policy-makers, both directly and indirectly, since publishing his group's acid rain findings in 1972 and 1974. After the 1974 Science paper was published, it was reported on the front page of *The New York Times*, which launched the research—and Dr. Likens himself—into the limelight. Since then, he has been called upon to provide expert acid rain advice to a variety of American politicians, from President Reagan and his Cabinet in 1983 to New York State Governor, Mario Cuomo, from the mid-80s to the mid-90s.

While Dr. Likens observes that the "interface between science and public policy is difficult and complex", he continues to strive to uphold the IES mission to "enhance the general understanding of ecology by students, policy makers, and the general public" and to "provide knowledge needed for the solution of environmental problems". With his recent recognition as a National Medal of Science Laureate, Dr. Likens has secured an even better position to fulfill these lofty goals, both for himself, for the Institute of Ecosystem Studies and for ecology.

Cole's Goal: Make Limnology a Household Word

Dr. Jonathan Cole, a Scientist at the Institute of Ecosystem Studies, was recently elected to be the next president of the American Society of Limnology and Oceanography (ASLO). Although based in North America, ASLO is the major professional organization for freshwater and marine scientists world wide, with about 3800 members from 58 different countries. ASLO publishes the leading scientific journal in the field, *Limnology and Oceanography*. *Oceanography* is the broad field covering the geology, physics, chemistry, biology and ecology of the oceans. *Limnology* covers the geology, physics, chemistry, biology and ecology of inland waters (lakes, rivers, streams, inland seas, and wetlands). Thus ASLO's members belong to diverse scientific disciplines. ASLO began as the Limnology Society of America in 1936 and became the American Society of Limnology and Oceanography in 1948. In addition to the scientific journal, ASLO sponsors annual scientific meetings at which new results are presented and discussed. Much can be learned about ASLO at www.aslo.org.

It is a prestigious honor to be elected as the president of a scientific society. Cole will serve as ASLO's 54th president, beginning with two years as president-elect on 1 July, 2002, followed by two years as president. Interestingly, Dr. Gene E. Likens, Director of IES (see article on page 1) served as the 36th president of ASLO from 1976-1977. Cole's interests cover the gamut of ASLO's scope, his Ph.D. work (at Cornell University) and post-doctoral work (at the Woods Hole Oceanographic Institute and the Marine Biological Laboratory on Cape Cod) involved marine systems, while his current work focuses on carbon cycling and microbial processes in lakes and rivers. One of the things Cole would like to accomplish as president of ASLO is to generate greater public awareness of limnology. While many people care deeply about such water-quality issues as clean drinking water, healthy fisheries and ample recreation, few realize the crucial roles of "limnology" and "limnologists" in providing the scientific understanding needed to address these issues. Thus his goal: making limnology a household word. ●

The Gifford Garden is especially beautiful this time of year. Many sun-loving perennials may be viewed throughout the garden.



Findlay Named Outstanding Environmental Researcher

by Sherri Hitz

At their annual meeting on June 6th, the Hudson River Environmental Society honored IES scientist Dr. Stuart Findlay (photo above) as this year's Outstanding Environmental Researcher. Dr. Findlay is a member of the Institute's highly collaborative "Hudson River Group", which also includes Drs. Jonathan Cole, Michael Pace, David Strayer and Nina Caraco. While the whole group has worked together to investigate the health and functioning of the river's ecosystems, Findlay has become especially visible to the public through his participation in various Hudson River advisory organizations, such as the Hudson River Estuary Management Advisory Committee.

As Findlay states, "the Hudson River is still not perceived as a valuable resource by most," and he has been working to rid both public and policy-makers of that misperception. In addition to providing expertise to advisory committees, Findlay directly contributes scientific knowledge to agencies such as the New York State Department of Environmental Conservation (DEC).

Findlay and colleagues recently produced a map of more than 700 patches of submersed vegetation in the Hudson River, revealing which patches are more and less "ecologically important", in terms of providing habitat for fish and invertebrates, and producing oxygen. With the map as a resource, DEC can make more informed decisions about whether to grant a use permit in a requested area, or protect it.

While most public agencies are starting to see the Hudson River as a resource worth protecting, some still seem to view it as the polluted, smelly eyesore it was in the mid-60s to late 70s. But, Findlay says, it's time for people to take another look at the river, and see it for what it is today: an increasingly healthy and valuable waterway.

Since passage of the Clean Water Act in 1972, and the Water Quality Act in 1987, both municipal (mainly sewage) and industrial (heavy metals, dioxins, PCBs, etc.) pollution of the Hudson have been reduced significantly. And in 1977, the U.S. banned the manufacture of PCBs, so they were no longer released into the river by companies such as General Electric.

As the Hudson River has gained increasing environmental protection, its aquatic ecosystems have progressively recovered. Some towns have begun to respond to the positive changes with riverside revitalization projects. One of the best efforts Findlay has seen is Kingston's Rondout area, which is now an attractive waterfront offering a wide selection of activities, including Hudson River boat tours. But some other towns haven't responded at all, and their riverfront districts are sitting idle and rundown.

Findlay has great hope for the future of the Hudson River. With careful management, and increasing public interest in the river—both as an ecosystem and as a recreational area—the Hudson River, its aquatic life and its human neighbors should be able to recover from a polluted past to enjoy a long and healthy future together. ●

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CONTINUING EDUCATION

For information, or to request a catalog, call the Continuing Education office at 845-677-9643 or visit www.ecostudies.org/education/continuing.html. Summer semester programs include:

Gardening

August 5 (4 Mon., 1 Sat.): **Fundamentals of Gardening**

August 10 (1 session): **Designing Gardens with form and Texture**

August 28 (1 session): **Plant for a Shady Garden**

Biology and Earth Science

August 17 (1 session): **Flowering Plant Identification**

SATURDAY ECOLOGY PROGRAMS

Come to **free public programs**. Children age 6 and up are welcome with an accompanying adult. Pre-registration isn't necessary. If you have questions, call 845-677-7600 ext. 317 for information on upcoming programs:

Oct. 5: **Dr. Dave Strayer**, freshwater ecologist at IES, will lead a stream walk on the institute's grounds. Programs are from 1 - 3 p.m. and begin at the Gifford House Visitor and Education Center. [Please dress for the weather, with sturdy, waterproof shoes.]

ECOLOGY FIELD PROGRAMS

Teachers – you can begin registering for our Ecology Field Programs now! Programs will be offered mid-October through June. We are reducing the number of classes that we accept in order to focus on longer-term projects, so please register early. To register call 845-677-7600 ext. 316.

IES SEMINARS

Free **scientific seminars** are held at 11 a.m. on Fridays in the auditorium from September until early May.

Sept. 13: Biodiversity and Watershed Ecology and Drylands. **Moshe Shachak**, The Jacob Blaustein Institute for Desert Research.

Sept. 20: **Dr. Art Gold**, University of Rhode Island
Sept. 27: **Dr. Justin Wright**, University of Washington

THE ECOLOGY SHOP

New items in the Shop. Wooden inlay boxes and keychains from tree-friendly Heartwood Creations, Inc... Mosquito sticks that really work...and The Rainforest Card Game. **In the Garden Room:** great new tools for gardeners...angle weeder...potting scoops...hand rakes...and a wonderful selection of plants.

Senior Citizens Days: 10% off on Wednesdays

GREENHOUSE

The greenhouse is a year-round tropical plant paradise and a site for controlled environmental research. The greenhouse is open daily until 3:30 p.m. with a free permit (see HOURS).

HOURS

Summer Hours: April 1 - September 30

Public attractions: Mon.-Sat., 9-6, Sun. 1-6; closed public holidays. The greenhouse closes at 3:30 daily.

The Ecology Shop: Mon.-Fri., 11-5, Sat. 9-5, Sun. 1-5. (Please note: The shop is closed Mon.-Sat. from 1-1:30.)

Free permits are required and are available at the Gifford House Visitor and Education Center until one hour before closing time.

FERN GLEN TOURS

Native Plant Program Assistant Janet Leete leads **free tours of the Fern Glen** on Tuesdays at 11 a.m. and 2 p.m. Pick up your free visitor permit at the Gifford House beforehand (see hours).

GROUP TOURS

We offer guided tours of the Gifford Garden, Fern Glen or Greenhouse, for garden clubs, horticulturists, community groups, and other groups. Tours should be arranged four weeks in advance. For information on fees, or to make reservations call Ms. Luanne Panarotti at 845-677-7600 ext. 317.

VOLUNTEER OPPORTUNITIES

Call Ms. Susan Eberth at 845-677-7600 ext. 316 or visit www.ecostudies.org/welcome/volunteer.html.

MEMBERSHIP

Join the Institute of Ecosystem Studies. Benefits include subscription to the IES Newsletter, member's rate for courses and excursions, a 10% discount on IES Ecology Shop purchases, and participation in a reciprocal admissions program. Individual membership: \$40; family membership: \$50. Call the Development Office at 845-677-7600 ext. 120.

The Institute's Aldo Leopold Society

In addition to receiving the benefits listed above, members of The Aldo Leopold Society are invited guests at spring and fall IES science updates. Call the Development Office at 845-677-7600 ext. 120.

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65 Sharon Tpke. (Rte. 44A), Millbrook, N.Y.

... for education, general information and
The Ecology Shop:

Institute of Ecosystem Studies
Education Program
Box R, Millbrook NY 12545-0178
Tel: 845-677-5359 • Fax: 845-677-6455

The Ecology Shop: 845-677-7600 ext. 309

Street address: Gifford House Visitor and Education
Center, 181 Sharon Tpke. (Rte. 44A), Millbrook, N.Y.

IES website: www.ecostudies.org

For information on current IES public events and attractions, visit: www.ecostudies.org/welcome/ThisWeek.html.

For garden tips, visit: www.ecostudies.org/welcome/gardens.html.